Validation of Predicted Benefits of Restoration Projects

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Restoration Projects

- 1135s and Mitigation
- Few post-project evaluations
- Benefits rarely validated
- New Work Unit: Ecosystem Management and Restoration Research Program (EMRRP)

Objective
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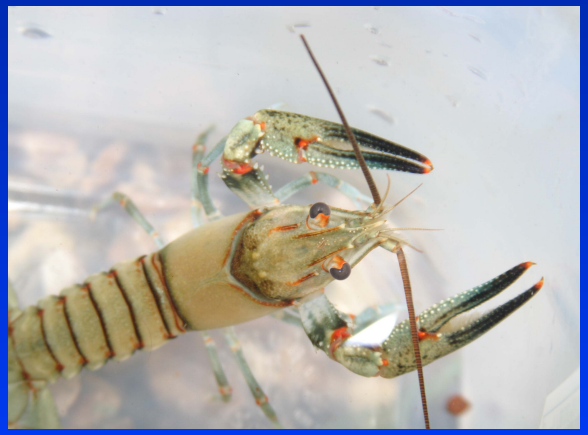
- Post-project sampling in restored water bodies
- Validate and refine pre-project predictive models
- Recommend restoration techniques with documented

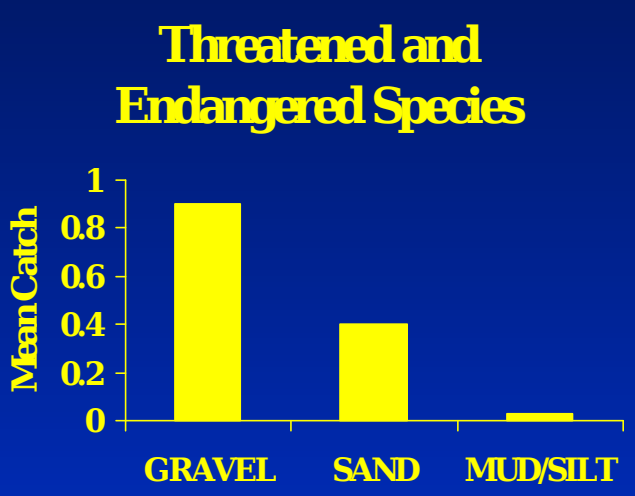


Restoration Projects

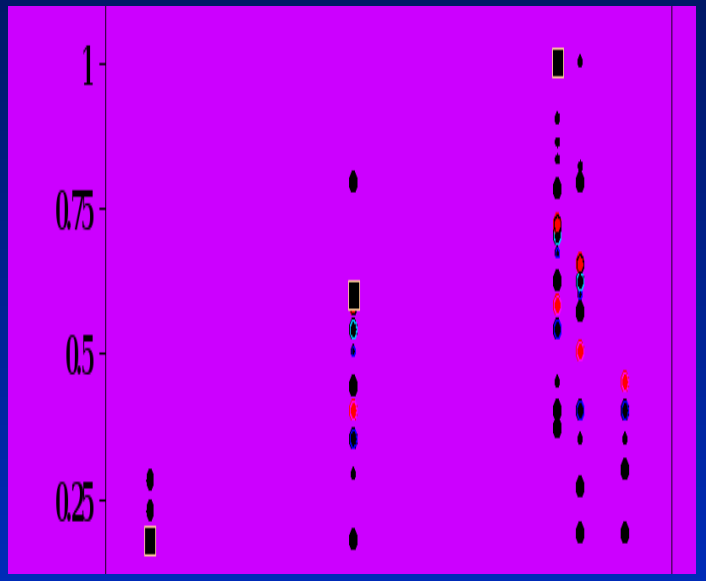
- Water level management
- Erosion Control
- Dike Notching
- Reforestation
- Connectivity
- Gravel Bars
- Structure

Examples of Models

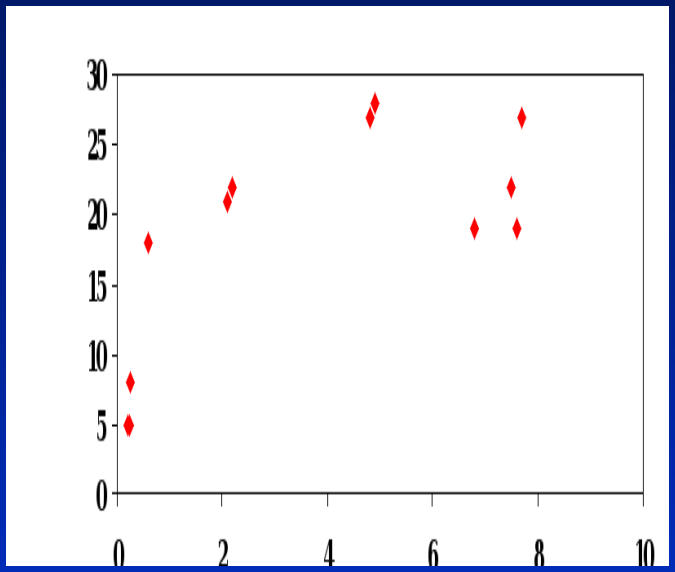
Class Variables



Wedge Shaped



Curvilinear



Multiple Regression

Species Richness = 0.542(Temperature) + 0.00039 (Mean Discharge) - 7.431

r^2 = 0.85, p=0.0001, n=17

Habitat Types

Validation Approaches

- Rapid Biological Assessment
  - Low variability systems (e.g., urban streams)
  - Qualitative changes (e.g., agricultural lands to bottomland hardwoods)
- Monitoring
  - High variability systems (e.g., big rivers)
  - Quantitative changes (e.g., dampened hydrographs)

Field Studi

Land Use
416
Warren
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Madison
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Texas
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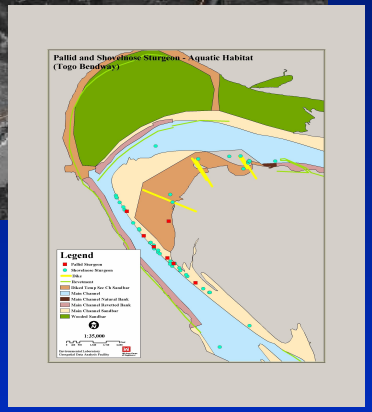

Pallid and Shovelnose Sturgeon - Aquatic Habitat
(Togo Bendway)
Legend
1:35,000

Habitat

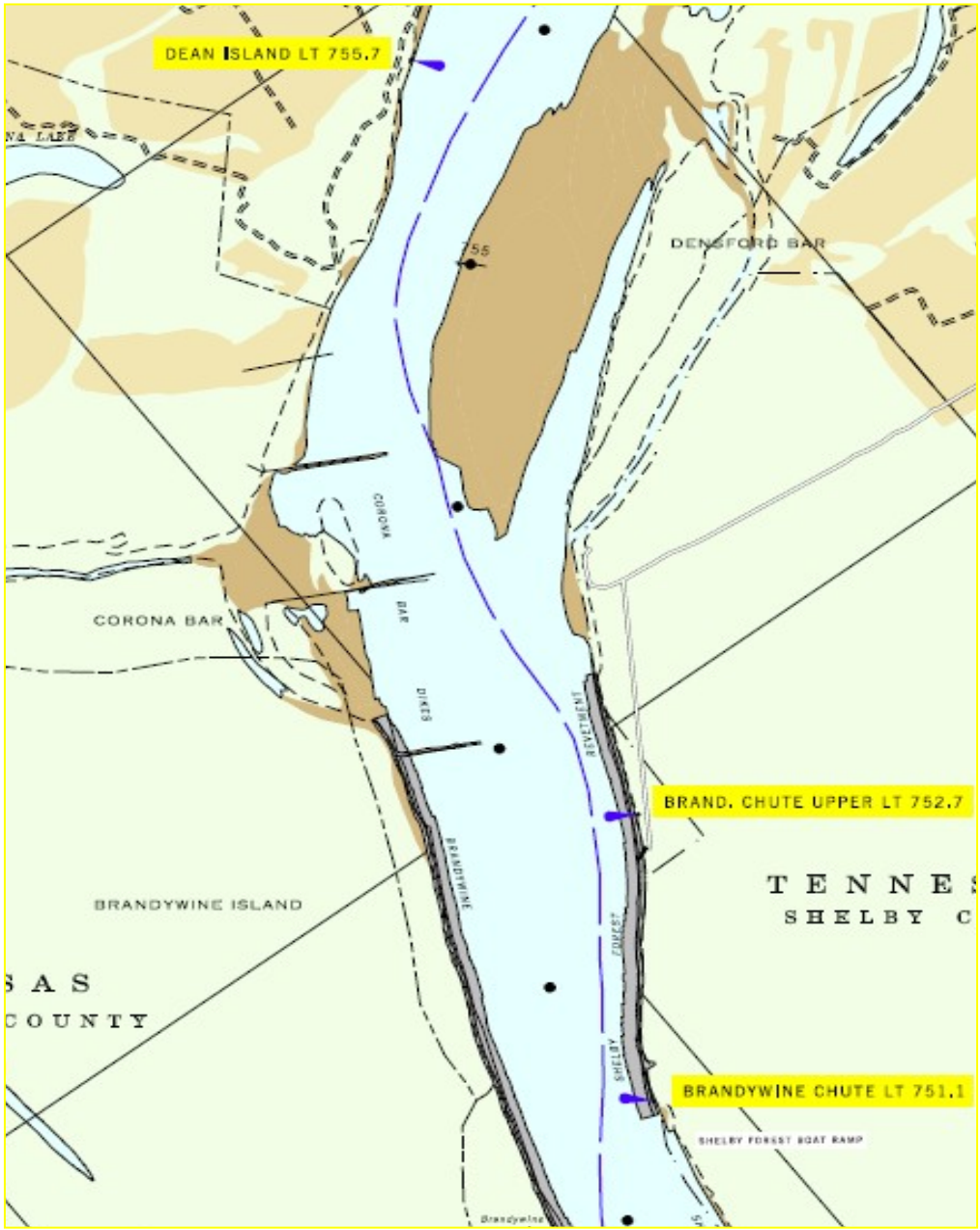
Biological Collections

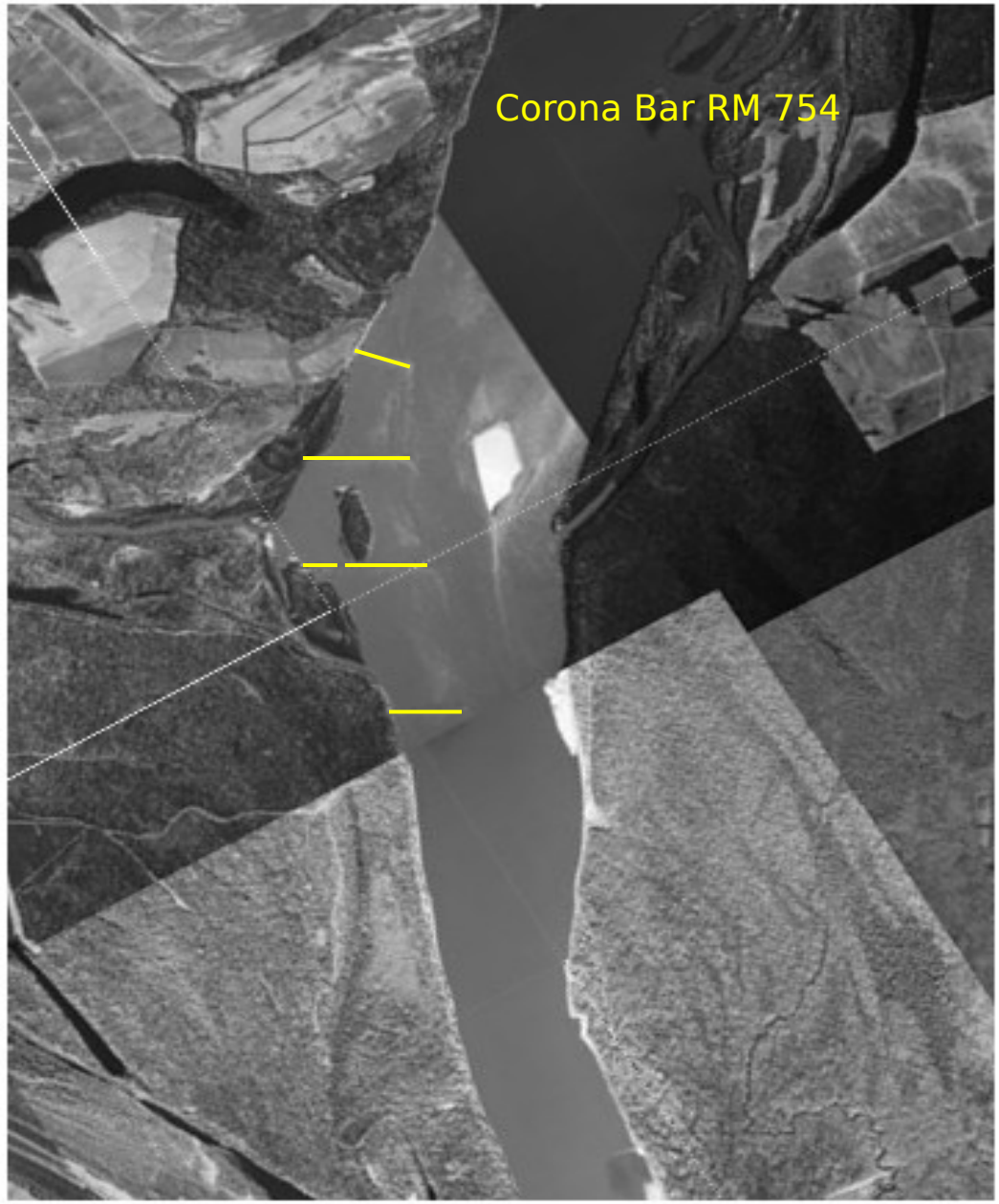
Possible Validation Studies

Restoration Measure	Projects
Water Level Management	Cypress Bayou, TX Grand Prairie, AR
Erosion Control	
Dike Notching	Mississippi River, TN-LA *
Reforestation	Yazoo River, MS
Connectivity	
Gravel Bars	Arkansas River, OK-AR *
Structure	
Sinuosity	

* Study could be leveraged with funding from

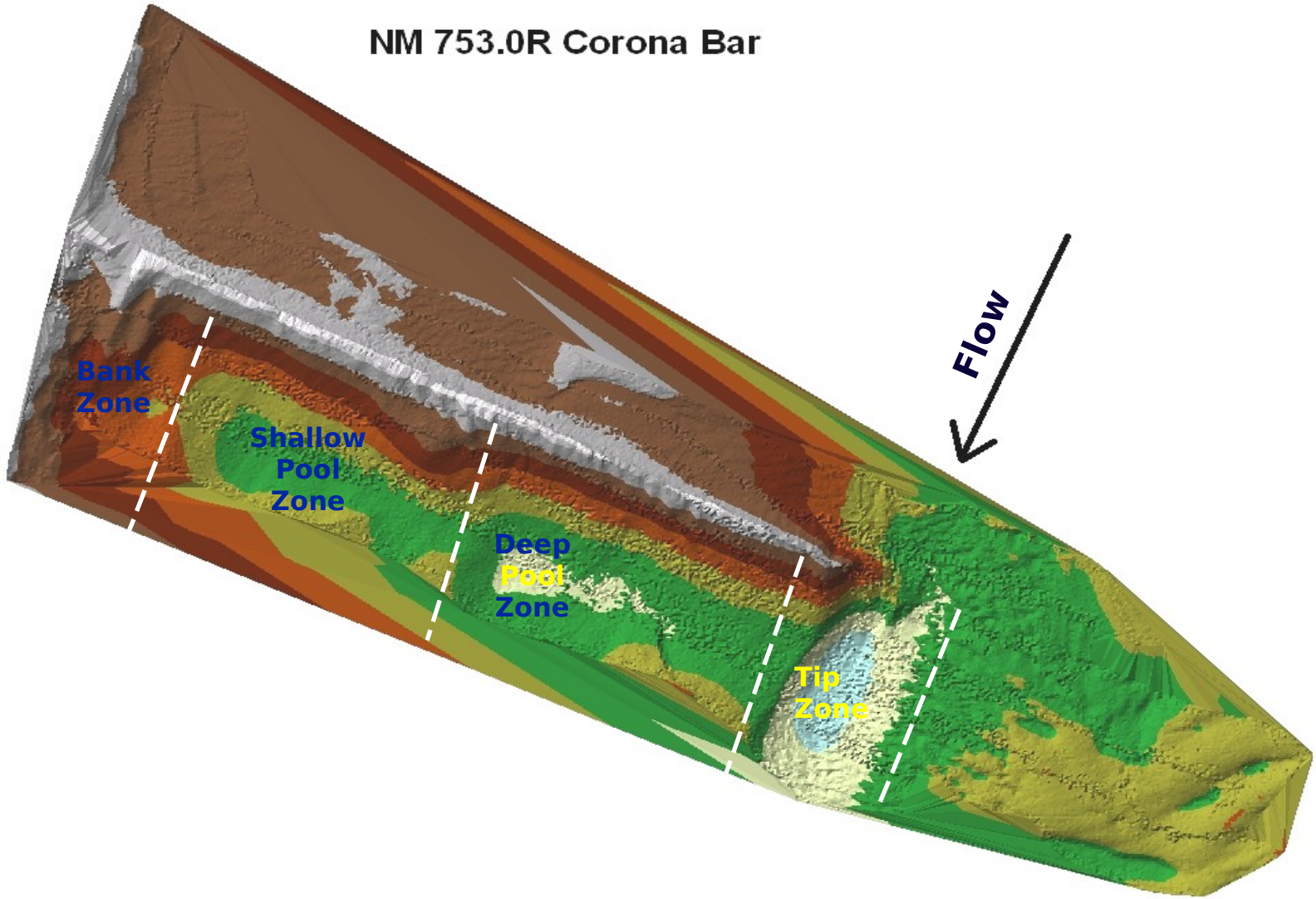
River


DEAN ISLAND LT 755.7
DENSFORD BAR
CORONA BAR
BRAND. CHUTE UPPER LT 752.7
BRANDYWINE ISLAND
BRANDYWINE CHUTE LT 751.1
SHELBY FOREST BOAT RAMP

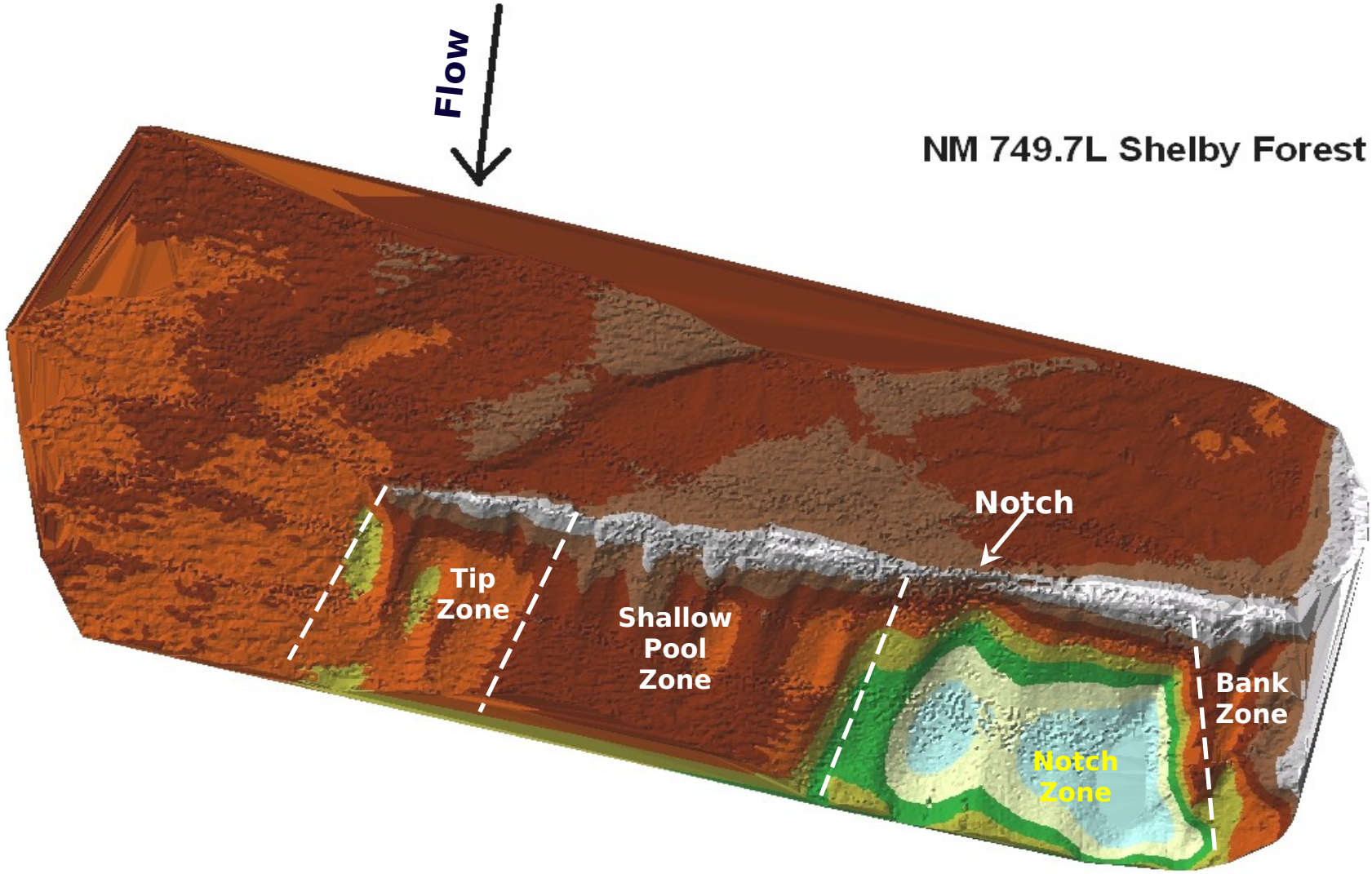

Corona Bar RM 754

May 2005

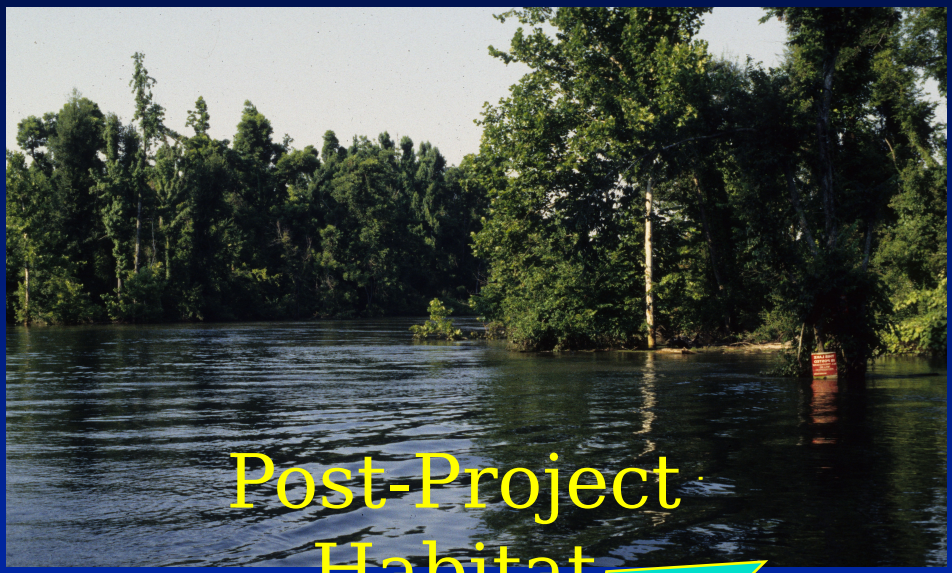
Non-notched dike sampling scheme



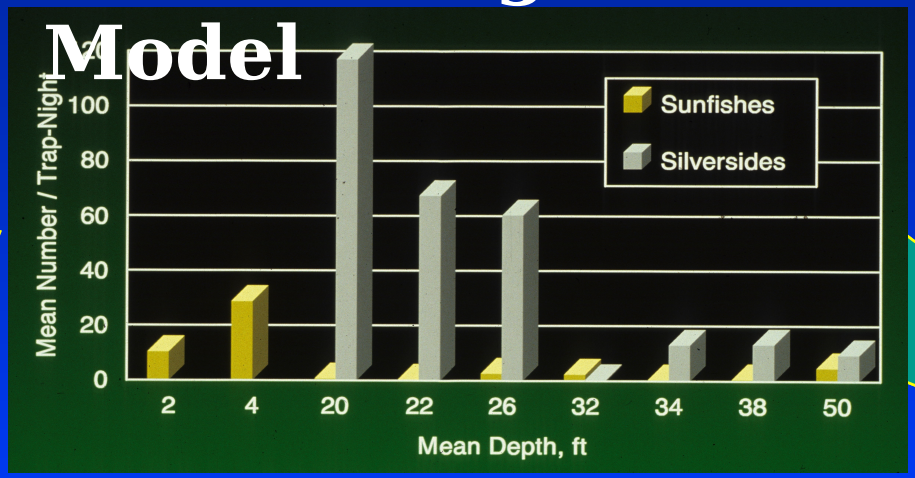
Notched dike sampling scheme



Validation Study Requirements



Habitat-Organism Model



Model Characteristics

- Project-specific, field derived
- Abiotic parameters (e.g., hydraulic, water quality, land-use) and biotic variables (populations, species, communities)
- Correlative analyses (e.g., regressions)
- Applicable to habitat areas weighted by “suitability” (e.g., Habitat Evaluation Procedure, Instream Flow Incremental Methodology)

End Products

IEB - Summary of existing predictive models used to quantify restoration benefits

TN - Validation and guidance on determining post-project benefits

- By habitat type

JA - Accuracy and precision of biological predictive models

Benefits

- Validated models ensure confidence the planning process
- Justifies restoration projects and acceptance by local sponsors.
- Validation provides opportunities to refine plans and specifications
- Better understanding of cause and ef mechanisms in ecosystem restorati